DECISION DOCUMENT
THORNE DRUM AREA, SWMU J-17
Hawthorne Army Depot
Hawthorne, Nevada
December 1999

1. PURPOSE of DECISION DOCUMENT

1.1 Introduction

This decision document describes the rationale for the remedial action at, and closure of, Solid Waste Management Unit (SWMU) J-17, Thorne Drum Area, Hawthorne, Nevada. This decision document was developed by the U.S. Army Corps of Engineers, Sacramento District (USACE), Day and Zimmermann Hawthorne Corporation (DZHC), and the Hawthorne Army Depot (HWAD), with support from the Nevada Department of Conservation and Natural Resources, Division of Environmental Protection (NDEP).

1.2 Site Description and Background

SWMU J-17 is located about 5,000 feet north of the HWAD installation boundary on land maintained by the U.S. Bureau of Land Management (BLM). The site falls within the Walker Lake 7.5 minute USGS quadrangle. The site is accessible from a dirt road that parallels the Southern Pacific rail line along the east shore of Walker Lake. The site is about two and one-half miles northwest of Thorne and about two miles east of the 1982 shoreline of Walker Lake.

The site is a former temporary habitation site and a trailer was located on the site. The nature of previous activities at this location is not precisely known. It was reportedly inhabited for several years and abandoned prior to or during the early 1970s (T. Erickson, September 1, 1993 personal communication). The site was identified as a potential SWMU because fiber drums and other debris found at this location apparently originated at HWAD. Some of these materials were available for purchase by the public from the HWAD Property Disposal office and do not necessarily represent hazardous materials or hazardous waste.

The site appears on a 1980 aerial photograph (EMSL, 1981). The photograph shows a faint boundary around an area about 750 feet on each side (about 13 acres). A dirt road about 1000 feet long runs up the alluvial apron from the county road through the 13 acre area. In the photograph, the habitation site, including a trailer, trench, drums, and boxes, and a drainage channel can be identified in the extreme north corner of the 13 acre area.

Tetra Tech reviewed all previous work done for the Group B SWMUs and compiled an annotated bibliography for past work (Tetra Tech, 1993).

Tetra Tech performed a visual inspection of the site in November 1993. At the top of the dirt road to the site is a loading ramp constructed of earth, which can be seen in the aerial photograph. The road marks the eastern boundary of the former habitation site. The northern boundary of the site is a dirt road with a shallow drainage ditch, about 1 feet

deep, along its northern edge. The road turns downhill about 375 feet west of the loading ramp, marking the eastern boundary of the former habitation site. The outer shoulder of the downhill arm of the road is lined with boulders. The downhill boundary of the site was not clear, since minor amounts of debris have rolled downslope over time.

The site contains a shallow excavated trench, about 75 feet from the west boundary road and 65 feet south of the north boundary road, which was apparently a sewage disposal trench. Apparently, the trailer was located at the head of the trench. A 20 feet length of drain pipe terminates at the head of the trench. The trench is about 60 feet long and contained a small amount of wood and metal debris. Most of the debris at the site is located adjacent to the north boundary road, in what appeared to have been a storage area. The debris included a variety of materials, most of which were not related to HWAD. These materials included about 15 rubber tires, a refrigerator, a five-gallon bucket containing dried tar, pallets, a part from a horse trailer, and other debris. Debris associated with HWAD included cardboard tubes, such as those used to pack rockets; decomposing fiber drums of the type that were used to contain aluminum powder; and metal collars of unknown origin. A disintegrating paper sack containing a white powder, possibly lime, and a dark brown solid were observed on a pallet.

The elevation of the ground surface at the site is about 4,190 feet above mean sea level (msl). There is no nearby well to base an estimated elevation or depth to ground water. However, the gradient of ground water flow is likely to the west towards Walker Lake.

1.3 Chemicals of Concern

The potential chemicals of concern are listed in Table 1.

TABLE 1 - SUMMARY of CHEMICALS of CONCERN

Chemical of Concern	Rationale Behind Designation	Reference
Petroleum Hydrocarbons	Possible disposal of petroleum hydrocarbons	USACE 1993
Metals	Disposal of metal debris	USACE 1993

2. SUMMARY of SITE RISK

All near surface soil samples were non-detect for total petroleum hydrocarbons as diesel (TPH-d). Detected concentrations of metals were below closure goals for all samples.

The original scope of the work plan included 'hazcat' analyses of white powder found at the site. Sampling of surface soil was completed within a few feet of this material, and no elevated levels of chemicals were detected. Therefore, additional characterization of this SWMU is not warranted.

3. SUMMARY of REMEDIAL INVESTIGATION and REMEDIAL ACTIONS

3.1 Remedial Investigations

3.1.1 Objectives

The objectives of the investigation of SWMU J-17 were:

- To determine the presence of metals and petroleum hydrocarbons in the near surface soils at the site, and
- To remove the non-hazardous debris that littered the site.

These objectives were met.

3.1.2 Planned and Actual Investigation

Planned and actual field investigation activities are described in Table 2. Figure J-17-2 shows the locations of the actual field investigation activities at SWMU J-17. A permanent monument was installed and surveyed and SWMU boundaries delineated at the locations shown in this figure. The appendices include HWAD proposed closure goals for soils, lab results and detection limits, survey results, and photographs. All activities were conducted based on the Work Plan (Tetra Tech, 1994a), Site Safety and Health Plan (Tetra Tech, 1994b) and the Chemical Data Acquisition Plan (Tetra Tech, 1994c).

TABLE 2 - SUMMARY of PLANNED and ACTUAL FIELD INVESTIGATION

Planned Investigation	Actual Investigation	Comments
Site Preparation - Removal and disposal of non-hazardous debris	**Site Preparation** - Removal and disposal of non-hazardous debris	
Near Surface Sampling - 8 sample locations	**Near Surface Sampling** - 8 sample locations	
Waste Characterization - 1 sample of a white powder and dark solid material	**Waste Characterization** - Not conducted	Recommend characterization prior to removal and disposal of white powder
Surveying - GPS[a] at surface sample locations	**Surveying** - GPS at surface sample locations	

[a]GPS = Global positioning system

Soil samples taken and analyses done included the following:

Sample Locations	Depth (ft)	Metals Analyses	BTEX Analyses	TPH-d Analyses
Near Surface SS01 - SS08 (8 locations)	0.5	Y	Y	Y

3.1.3 Results

Table 3 lists the analytical results for metals in the surface soil. The associated background levels of metals and the proposed closure goals are also shown.

TABLE 3 - SUMMARY OF METALS ANALYTICAL RESULTS

Sample Number	Sampled Date	Sample Depth (ft)	Metals (mg/kg) EPA Method 6010 (Method 7471 for Hg) As	Ba	Cd	Cr	Pb	Hg	Se	Ag
Near Surface Sampling										
J17-SS01-1-S	13-Jul-94	0.25 - 0.50	ND[a]	58	0.28	1.2	ND	0.040	ND	ND
J17-SS02-1-S	13-Jul-94	0.25 - 0.50	7.6	79	0.30	1.3	5.6	ND	ND	ND
J17-SS03-1-S	13-Jul-94	0.25 - 0.50	4.7	53	ND	1.5	ND	ND	ND	ND
J17-SS04-1-S	13-Jul-94	0.25 - 0.50	9.0	200	0.27	1.0	ND	ND	ND	ND
J17-SS05-1-S	13-Jul-94	0.25 - 0.50	7.2	190	0.89	6.4	11	0.050	ND	ND
J17-SS06-1-S	13-Jul-94	0.25 - 0.50	ND	41	ND	0.9	ND	ND	ND	ND
J17-SS07-1-S	13-Jul-94	0.25 - 0.50	ND	57	ND	1.3	5.3	ND	ND	ND
J17-SS08-1-S	13-Jul-94	0.25 - 0.50	ND	62	0.21	1.8	ND	0.20	ND	ND
Associated Background Samples	**Soil Series**	**Mappable Unit**	**As**	**Ba**	**Cd**	**Cr**	**Pb**	**Hg**	**Se**	**Ag**
B13	Torriorthents	390	4	76	0.25	4.7	ND	ND	ND	ND
Proposed Closure Goals			30	5,600	40	80,000	1,000	24	400	400

[a]ND = Non-detect, below laboratory method detection limit for all analytes. See Appendix B for quantitation limits.

Table 4 lists the analytical results for benzene, toluene, ethylbenzene and xylene (BTEX), and total petroleum hydrocarbons as diesel (TPH-d) for the surface soil samples. All samples had BTEX immunoassay screening results at concentrations less than 10 mg/kg and no detections of TPH-d.

TABLE 4 - SUMMARY of BTEX and TPH-DIESEL ANALYTICAL RESULTS

Sample Number	Sampled Date	Sample Depth	BTEX Immunoassay Test	TPH-Diesel EPA Method 8015-M
Near Surface Sampling				
J17-SS01-1-S	13-Jul-94	0.25 - 0.50	>2 and <10	ND*
J17-SS02-1-S	13-Jul-94	0.25 - 0.50	>2 and <10	ND
J17-SS03-1-S	13-Jul-94	0.25 - 0.50	>2 and <10	ND
J17-SS04-1-S	13-Jul-94	0.25 - 0.50	>2 and <10	ND
J17-SS05-1-S	13-Jul-94	0.25 - 0.50	>2 and <10	ND
J17-SS06-1-S	13-Jul-94	0.25 - 0.50	>2 and <10	ND
J17-SS07-1-S	13-Jul-94	0.25 - 0.50	>2 and <10	ND
J17-SS08-1-S	13-Jul-94	0.25 - 0.50	<2	ND

*ND = Non-detect, below laboratory method detection limit for all analytes

3.2 Remedial Actions

3.2.1 Summary of Remedial Alternatives

All surface items will be removed from the SWMU. Two soil samples will be collected after removal of surface items.

3.2.2 Summary of Remedial Actions

The surface debris was removed and two surface soil samples were collected from either side of the small trench at the site. Photographs of the site before and after the implementation of this remedial action are attached.

4. CONCLUSION

The HWAD proposed closure goals are listed in Appendix A. These closure goals were used in evaluating the detected chemicals.

All near surface soil samples had concentrations below laboratory method detection limits for TPH-d. Detected concentrations of metals were below closure goals for all samples.

The original scope of the work plan included 'hazcat' analyses of white powder found at the site. Sampling of surface soil was completed within a few feet of this material, and no elevated levels of chemicals were detected. Therefore, additional characterization of this SWMU is not warranted.

No further investigation will be performed at this SWMU and the site will be closed with regard to the chemicals of concern and without land use restrictions.

5. PUBLIC/COMMUNITY INVOLVEMENT

It is U.S. Department of Defense and Army policy to involve the local community throughout the investigation process at an installation. To initiate this involvement, HWAD has established a repository library in the local public library, which includes final copies of all past studies and documents regarding environmental issues at the facility. This repository will be maintained and updated with all future final documents as they are issued to HWAD.

HWAD has solicited community participation in establishment of the restoration advisory board (RAB). However, because of insufficient public response, HWAD has not formed a RAB. HWAD will continue to solicit community involvement, if sufficient community interest can be obtained.

6. DECLARATION

The selected remedy is protective of human health and the environment. It has been shown that a complete exposure pathway to human health and the environment does not exist, and there is no potential for such an exposure pathway to be completed in the future.

U.S. ARMY

18 JAN 2000
Date

James A. Piner,
Lieutenant Colonel, U.S. Army
Commanding

STATE OF NEVADA

22 March 2000
Date

Paul Liebendorfer
Chief, Bureau of Federal Facilities

REFERENCES

EMSL. 1981. Aerial Reconnaissance of Hazardous Waste Sites, Weed Heights and Hawthorne, Nevada. TS-AMD-8106. (Environmental Monitoring Systems Laboratory, Las Vegas, NV). Prepared for U.S. EPA Region 9 by Lockheed Engineering and Management Services Co., Inc., Las Vegas, NV.

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RAI. 1992. Site Screening Inspection (SSI) for the Hawthorne Army Ammunition Plant, Hawthorne, NV. Prepared for the U.S. Army Corps of Engineers Toxic and Hazardous Materials Agency by Resource Applications, Inc., Falls Church, VA. December, 1992. Contract No. DAAA 15-90-D-003, Task 5.

Tetra Tech. 1993. Draft Technical Memorandum for Group B SWMUs, Hawthorne Army Ammunition Plant. November 22, 1993.

Tetra Tech. 1994a. Remedial Investigation, Group B SWMUs, Final Work Plan, Volume 1, Investigation Description, and Volume 2, Sampling and Analysis Plans, Hawthorne Army Ammunition Plant. May, 1994.

Tetra Tech. 1994b. Site Safety and Health Plan, Hawthorne Army Ammunition Plant. June, 1994.

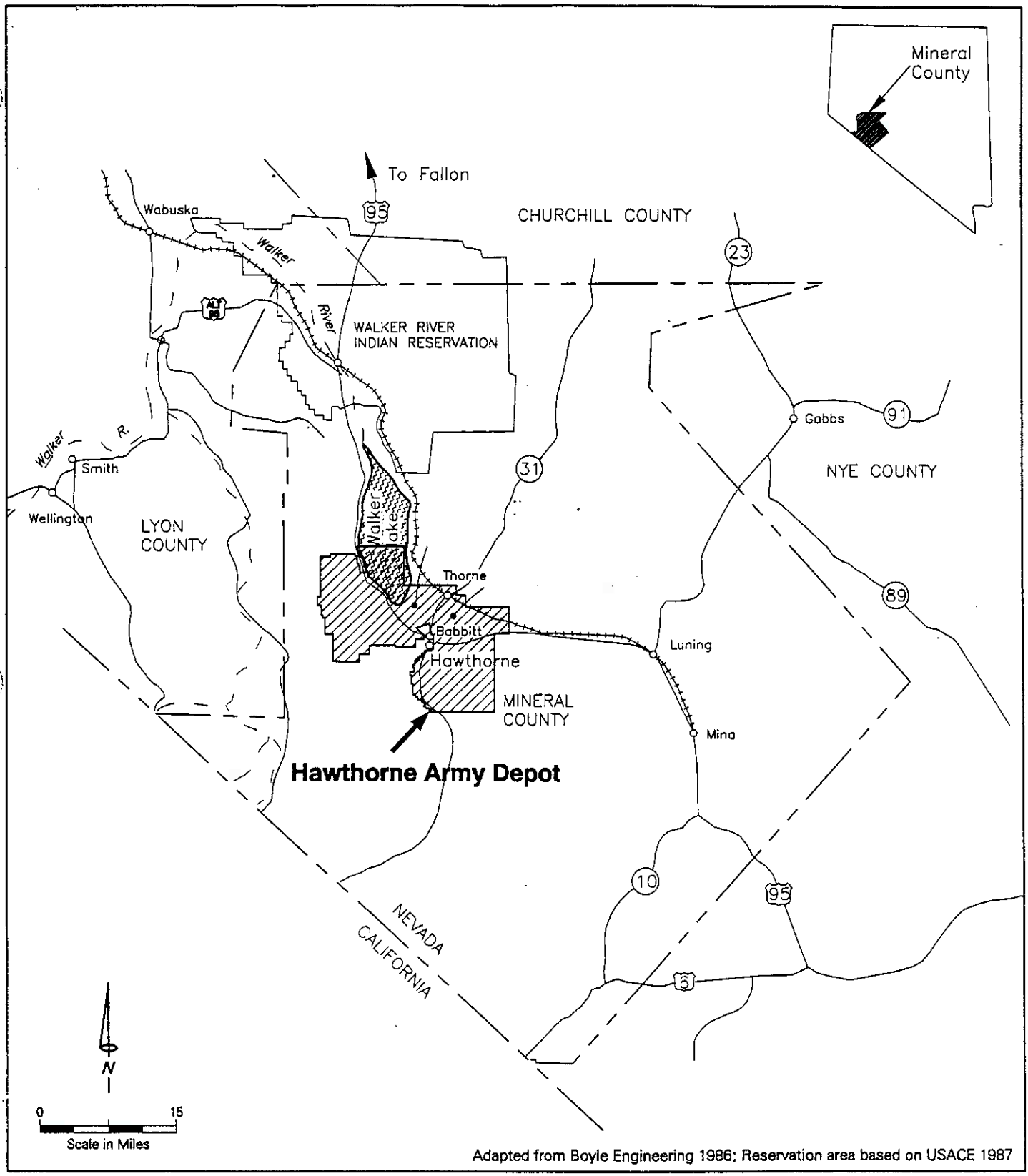
Tetra Tech. 1994c. Final Chemical Data Acquisition Plan, Hawthorne Army Ammunition Plant. June 28, 1994.

Tetra Tech. 1995. Group B Chemical Data Submittal, Hawthorne Army Ammunition Plant. March, 1995.

Tetra Tech. 1996. Hawthorne Army Depot Remedial Investigation Group B Solid Waste Management Units, Final Closure Report, SWMU A-03 Coal Ash Landfill, SWMU B-28a 108-20a EO Spill Impoundment, SWMU B-28b 108-20b EO Spill Impoundment, SWMU B-28c 104-8 EO Spill Impoundment, SWMU B-28d 104-10 EO Spill Impoundment, SWMU I-14 Bldg 46 Spill Site, SWMU J-04 107 Drum Storage, SWMU J-05 Dock 1 Landfill, SWMU J-06 Dock 2 Landfill, SWMU J-07 Dock 3 Landfill, SWMU J-08 Dock 4 Landfill, SWMU J-09 Dock 5 Landfill, SWMU J-10 Dock 6 Landfill, SWMU J-13 WADF South Dump, SWMU J-17 Thorne Drum Area, SWMU J-21 Bldg 97 Old Dock Area, SWMU J-22 50 Group Pits, SWMU J-24 Trench near 50-60.

USACE. 1993. Installation Action Plan for Hawthorne Army Ammunition Plant (HWAAP), prepared by S. Hong

Figures



Adapted from Boyle Engineering 1986; Reservation area based on USACE 1987

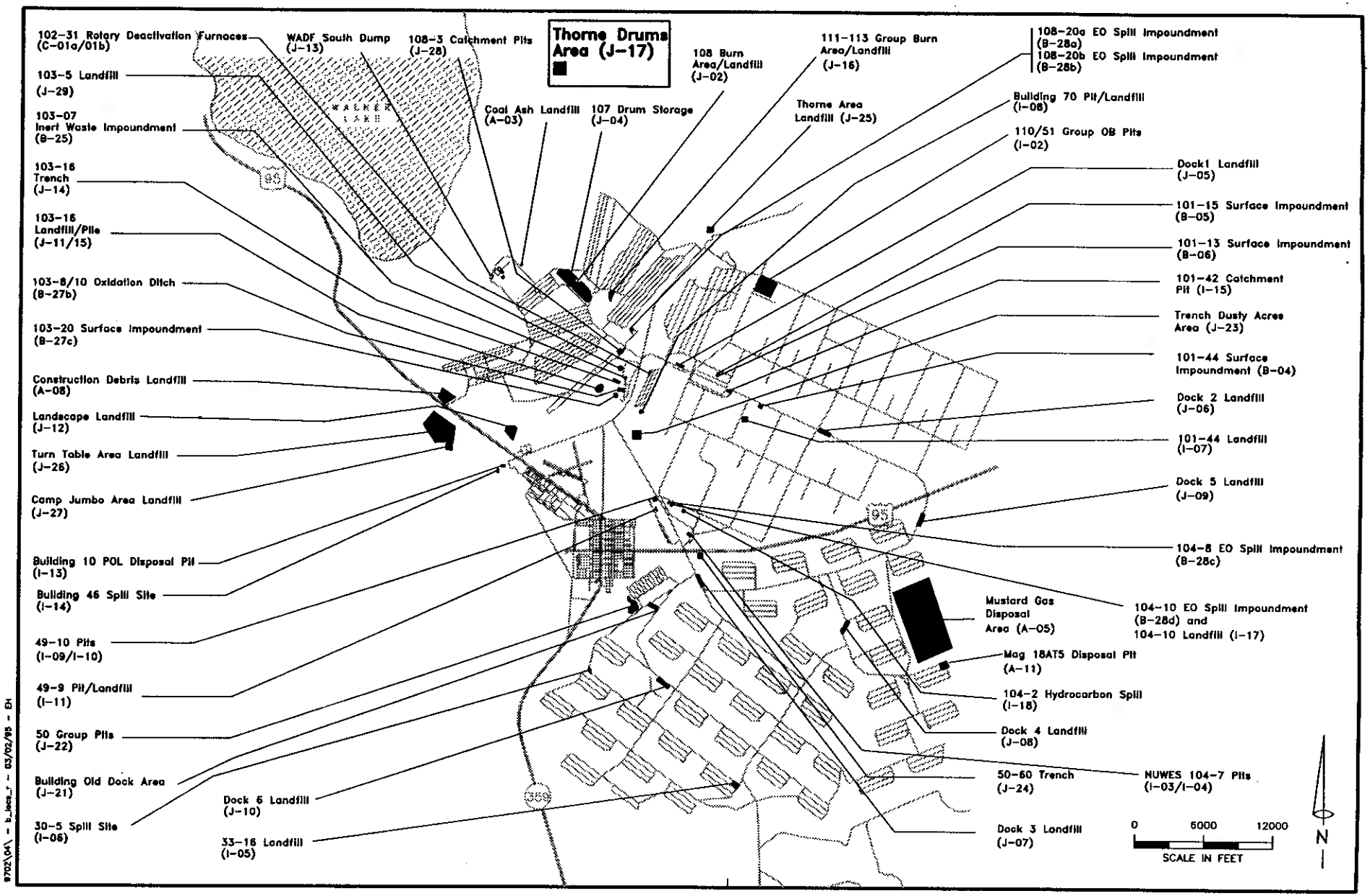
Location Map

Legend

Hawthorne Army Depot

Hawthorne Army Depot
Hawthorne, Nevada

Tetra Tech, Inc.

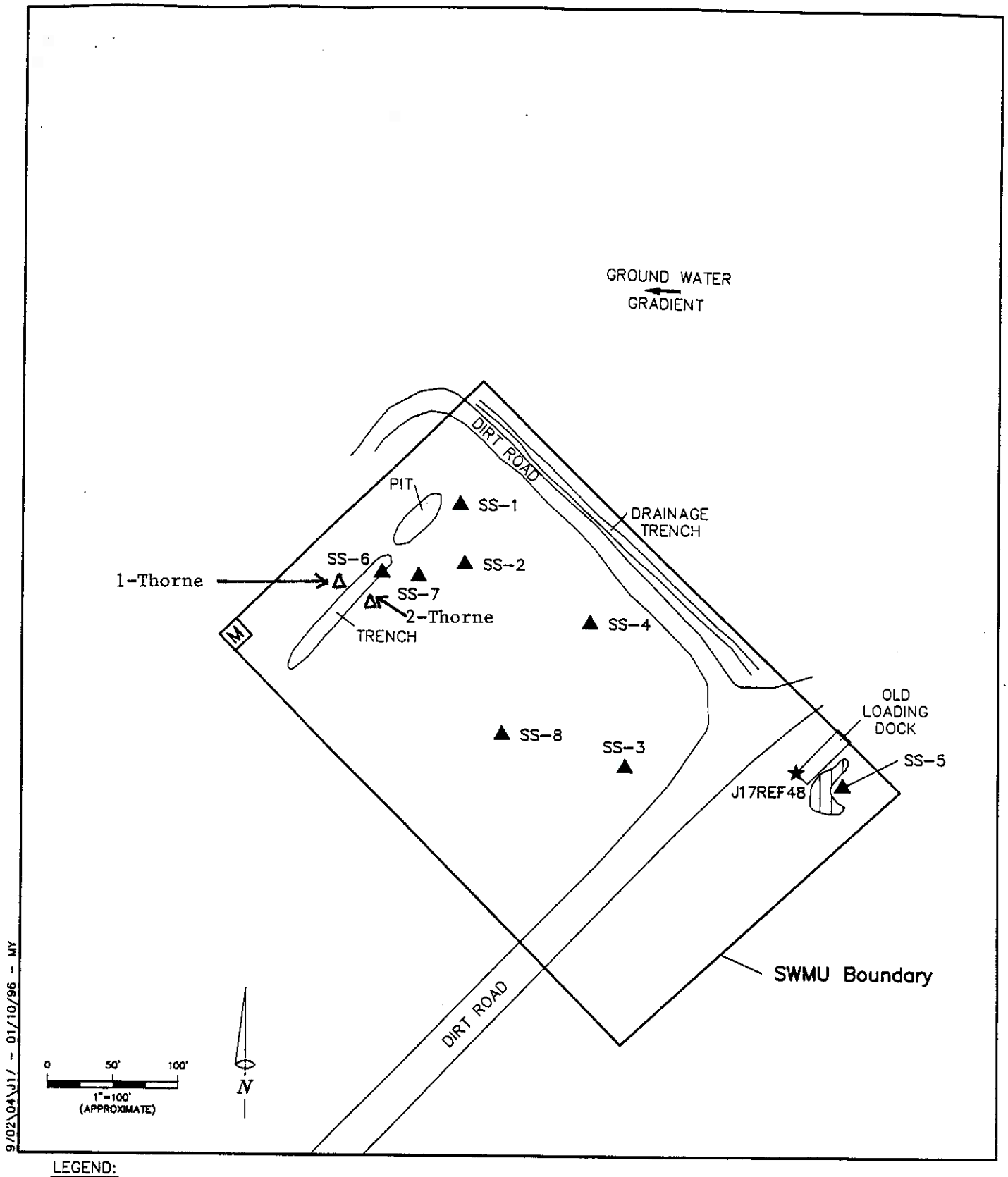


TETRA TECH

Location Map
Hawthorne Army Depot

Hawthorne, Nevada

Figure SWMU-J-17-1



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LEGEND:

★ SWMU Reference Point

▲ SS-X Surface sample location and number

Berm/Pile

M Monument location

Source: Base map digitized from Aerial Photo Survey, June 1994. Geophysical data from Geophysical Survey, NORCAL, August 1994.

TETRA TECH

Activity Map
SWMU J-17-2
Thorne Drums Area

Hawthorne Army Depot
Hawthorne, Nevada

Figure J-17-2

Appendix A

Proposed Closure Goals
Hawthorne Army Depot
Hawthorne, Nevada

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Nitrate	Anion	NC	128,000	Calculated Subpart S[a]
2-Amino-dinitrotoluene	Explosive	NC	-	NA[b]
4-Amino-dinitrotoluene	Explosive	NC	-	NA
1,3-Dinitrobenzene	Explosive	NC	8	Calculated Subpart S
2,4-Dinitrotoluene	Explosive	NC	160	Calculated Subpart S
2,6-Dinitrotoluene	Explosive	NC	80	Calculated Subpart S
HMX	Explosive	NC	4,000	Calculated Subpart S
Nitrobenzene	Explosive	NC	40	Calculated Subpart S
Nitrotoluene (2-, 3-, 4-)	Explosive	NC	800	Calculated Subpart S
RDX	Explosive	NC	64	Calculated Subpart S
Tetryl	Explosive	NC	800	Calculated Subpart S
1,3,5-Trinitrobenzene	Explosive	NC	4	Calculated Subpart S
2,4,6-Trinitrotoluene	Explosive	C	233	Calculated Subpart S
Aluminum	Metal	NC	80,000	Calculated Subpart S
Arsenic (cancer endpoint)	Metal	C & NC	30	Background[c]
Barium and compounds	Metal	NC	5,600	Calculated Subpart S
Beryllium and compounds	Metal	C	1	Background
Cadmium and compounds	Metal	NC	40	Calculated Subpart S
Chromium III and compounds	Metal	NC	80,000	Calculated Subpart S
Lead	Metal	NC	1000	PRG[d]
Mercury and compounds (inorganic)	Metal	NC	24	Calculated Subpart S
Selenium	Metal	NC	400	Calculated Subpart S
Silver and compounds	Metal	NC	400	Calculated Subpart S
Acenaphthene	PAH	NC	4,800	Calculated Subpart S
Benzo[a]anthracene	PAH	C	0.96	Calculated Subpart S
Benzo[a]pyrene	PAH	C	0.10	Detection Limit[e]
Benzo[b]fluoranthene	PAH	C	0.96	Calculated Subpart S
Benzo[k]fluoranthene	PAH	C	10	Calculated Subpart S
Chrysene	PAH	C	96	Calculated Subpart S
Dibenz[ah]anthracene	PAH	C	0.96	Calculated Subpart S
Fluoranthene	PAH	NC	3,200	Calculated Subpart S
Fluorene	PAH	NC	3,200	Calculated Subpart S
Indeno[1,2,3-cd]pyrene	PAH	C	-	NA
Naphthalene	PAH	NC	3,200	Calculated Subpart S
Pyrene	PAH	NC	2,400	Calculated Subpart S
Total Petroleum Hydrocarbons as Diesel (TPH-d)	PAH	C	100	NDEP Level Clean-up[f]
Polychlorinated biphenyls (PCBs)	PCBs	C	25	TSCA[g]
Bis(2-ethylhexyl)phthalate (DEHP)	SVOC	C	1,600	Calculated Subpart S
Bromoform (tribromomethane)	SVOC	C	89	Calculated Subpart S

Proposed Closure Goals
Hawthorne Army Depot
Hawthorne, Nevada

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Butyl benzyl phthalate	SVOC	NC	16,000	Calculated Subpart S
Dibromochloromethane	SVOC	C	83	Calculated Subpart S
Dibutyl-phthalate	SVOC	NC	8,000	Calculated Subpart S
Diethyl phthalate	SVOC	NC	64,000	Calculated Subpart S
Phenanthrene	SVOC		-	NA
Phenol	SVOC	NC	48,000	Calculated Subpart S
Acetone	VOC	NC	800	Calculated Subpart S
Anthracene	VOC	NC	24,000	Calculated Subpart S
Benzene	VOC	C	24	Calculated Subpart S
Bis(2-chloroisopropyl)ether	VOC	C	3,200	Calculated Subpart S
Bromomethane	VOC	NC	112	Calculated Subpart S
Carbon tetrachloride	VOC	C	5	Calculated Subpart S
Chlorobenzene	VOC	NC	1,600	Calculated Subpart S
Chloroform	VOC	C	115	Calculated Subpart S
Chloromethane	VOC	C	538	Calculated Subpart S
Dibromomethane	VOC	C	0.008	Calculated Subpart S
1,2-Dichlorobenzene	VOC	NC	7,200	Calculated Subpart S
1,4-Dichlorobenzene	VOC	C	18,300	Calculated Subpart S
Dichlorodifluoromethane	VOC	C	16,000	Calculated Subpart S
Ethylbenzene	VOC	NC	8,000	Calculated Subpart S
Methylene bromide	VOC	NC	800	Calculated Subpart S
Methylene chloride	VOC	C	4,800	Calculated Subpart S
2-Methylnaphthalene	VOC		-	NA
1,1,2,2-Tetrachloroethane	VOC	C	35	Calculated Subpart S
Tetrachloroethylene (PCE)	VOC	C & NC	800	Calculated Subpart S
Toluene	VOC	NC	16,000	Calculated Subpart S
1,1,1-Trichloroethane	VOC	NC	7,200	Calculated Subpart S
Trichloroethylene (TCE)	VOC	C & NC	480	Calculated Subpart S
Trichlorofluoromethane	VOC	NC	24,000	Calculated Subpart S
1,2,3-Trichloropropane	VOC	C	480	Calculated Subpart S
Vinyl chloride	VOC	C	0.37	Calculated Subpart S
Xylene Total (m-, o-, p-)	VOC	NC	160,000	Calculated Subpart S
2,3,7,8-TCDD	Dioxin	C	0.000005	Calculated Subpart S

[a] RCRA 55 FR 30870

[b] Not available

[c] Highest background concentration detected in 50 background soil samples

[d] Smucker, Stanford J. USEPA Rgion IX, Preliminary Remedial Goals, Second Half, Sep. 1995

[e] Method detection limit for Volatile Organic Compounds by EPA Method 8260 or Semi-Volatile Organic Compounds analyzed by EPA Method 8270

[f] Nevada Division of Environmental Protection

[g] Cleanup level for PCB spills in accordance with Toxic Substance and Control Act Spill Policy Guidelines 40 CFR 761

Appendix B

Summary Table of Analytical Data

SWMU J17 - Thorne Drums Area

Hawthorne Army Depot

Hawthorne, Nevada

January 1996

FINAL

FINAL

Sample ID	Sample Depth (ft)	Sample Date	Method	Analyte	Value	Units	Flag
J17-SS01-1-S	0.25-0.5	7/13/94	6010	Arsenic	< 4	mg/kg	
J17-SS01-1-S	0.25-0.5	7/13/94	6010	Barium	58	mg/kg	
J17-SS01-1-S	0.25-0.5	7/13/94	6010	Cadmium	0.28	mg/kg	U
J17-SS01-1-S	0.25-0.5	7/13/94	6010	Chromium	1.2	mg/kg	J
J17-SS01-1-S	0.25-0.5	7/13/94	6010	Lead	< 5	mg/kg	
J17-SS01-1-S	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS01-1-S	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS01-1-S	0.25-0.5	7/13/94	7471	Mercury	0.04	mg/kg	
J17-SS01-1-S	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS01-1-S	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.26	percent	
J17-SS01-1-S	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	2< X <10	mg/kg	
J17-SS02-1-S	0.25-0.5	7/13/94	6010	Arsenic	7.6	mg/kg	J
J17-SS02-1-S	0.25-0.5	7/13/94	6010	Barium	79	mg/kg	
J17-SS02-1-S	0.25-0.5	7/13/94	6010	Cadmium	0.3	mg/kg	U
J17-SS02-1-S	0.25-0.5	7/13/94	6010	Chromium	1.3	mg/kg	J
J17-SS02-1-S	0.25-0.5	7/13/94	6010	Lead	5.6	mg/kg	J
J17-SS02-1-S	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS02-1-S	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS02-1-S	0.25-0.5	7/13/94	7471	Mercury	< 0.04	mg/kg	
J17-SS02-1-S	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS02-1-S	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.56	percent	
J17-SS02-1-S	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	2< X <10	mg/kg	
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	6010	Arsenic	6.1	mg/kg	J
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	6010	Barium	65	mg/kg	
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	6010	Cadmium	0.23	mg/kg	J
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	6010	Chromium	1.1	mg/kg	J
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	6010	Lead	< 5	mg/kg	
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	7471	Mercury	< 0.04	mg/kg	
J17-SS02-1-SD (DP071	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,1,1,2-Tetrachloroethane	< 0.4	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,1,1-Trichloroethane	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,1,2,2-Tetrachloroethane	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,1,2-Trichloroethane	< 0.4	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,1-Dichloroethane	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,1-Dichloroethene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,2,3-Trichloropropane	< 0.8	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,2-Dichlorobenzene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,2-Dichloroethane	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,2-Dichloropropane	< 0.8	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,3-Dichlorobenzene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	1,4-Dichlorobenzene	< 0.4	ug/kg	

Summary Table of Analytical Data

SWMU J17 - Thorne Drums Area

Hawthorne Army Depot

Hawthorne, Nevada

January 1996

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Sample ID	Sample Depth (ft)	Sample Date	Method	Analyte	Value	Units	Flag
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	2-Chloroethylvinylether	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Benzene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Benzyl chloride	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Bromobenzene	< 0.4	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Bromodichloromethane	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Bromoform	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Bromomethane	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Carbon Tetrachloride	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Chlorobenzene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Chloroethane	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Chloroform	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Chloromethane	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	cis-1,3-Dichloropropene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Dibromochloromethane	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Dibromomethane	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Dichlorodifluoromethane	< 0.1	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Ethylbenzene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Methylene chloride	< 0.4	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Tetrachloroethene	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Toluene	< 0.4	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Total Xylene Isomers	< 0.6	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	trans-1,2-Dichloroethene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	trans-1,3-Dichloropropene	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Trichloroethene	< 1	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Trichlorofluoromethane	< 0.1	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	8260	Vinyl chloride	< 0.2	ug/kg	
J17-SS02-1-SD (DP070	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.29	percent	
J17-SS02-1-SD (DP073	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.1	percent	
J17-SS02-1-SD (DP069	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	2< X <10	mg/kg	
J17-SS03-1-S	0.25-0.5	7/13/94	6010	Arsenic	4.7	mg/kg	J
J17-SS03-1-S	0.25-0.5	7/13/94	6010	Barium	53	mg/kg	
J17-SS03-1-S	0.25-0.5	7/13/94	6010	Cadmium	< 0.2	mg/kg	
J17-SS03-1-S	0.25-0.5	7/13/94	6010	Chromium	1.5	mg/kg	J
J17-SS03-1-S	0.25-0.5	7/13/94	6010	Lead	< 5	mg/kg	
J17-SS03-1-S	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS03-1-S	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS03-1-S	0.25-0.5	7/13/94	7471	Mercury	< 0.04	mg/kg	
J17-SS03-1-S	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS03-1-S	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0	percent	
J17-SS03-1-S	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	2< X <10	mg/kg	
J17-SS04-1-S	0.25-0.5	7/13/94	6010	Arsenic	9	mg/kg	J
J17-SS04-1-S	0.25-0.5	7/13/94	6010	Barium	200	mg/kg	
J17-SS04-1-S	0.25-0.5	7/13/94	6010	Cadmium	0.27	mg/kg	U

Summary Table of Analytical Data

SWMU J17 - Thorne Drums Area

Hawthorne Army Depot

Hawthorne, Nevada

January 1996

Sample ID	Sample Depth (ft)	Sample Date	Method	Analyte	Value	Units	Flag
J17-SS04-1-S	0.25-0.5	7/13/94	6010	Chromium	1	mg/kg	J
J17-SS04-1-S	0.25-0.5	7/13/94	6010	Lead	< 5	mg/kg	
J17-SS04-1-S	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS04-1-S	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS04-1-S	0.25-0.5	7/13/94	7471	Mercury	< 0.04	mg/kg	
J17-SS04-1-S	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS04-1-S	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.49	percent	
J17-SS04-1-S	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	2< X <10	mg/kg	
J17-SS05-1-S	0.25-0.5	7/13/94	6010	Arsenic	7.2	mg/kg	J
J17-SS05-1-S	0.25-0.5	7/13/94	6010	Barium	190	mg/kg	
J17-SS05-1-S	0.25-0.5	7/13/94	6010	Cadmium	0.89	mg/kg	U
J17-SS05-1-S	0.25-0.5	7/13/94	6010	Chromium	6.4	mg/kg	
J17-SS05-1-S	0.25-0.5	7/13/94	6010	Lead	11	mg/kg	J
J17-SS05-1-S	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS05-1-S	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS05-1-S	0.25-0.5	7/13/94	7471	Mercury	0.05	mg/kg	J
J17-SS05-1-S	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS05-1-S	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.78	percent	
J17-SS05-1-S	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	2< X <10	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	6010	Arsenic	< 4	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	6010	Barium	41	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	6010	Cadmium	< 0.2	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	6010	Chromium	0.9	mg/kg	J
J17-SS06-1-S	0.25-0.5	7/13/94	6010	Lead	< 5	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	7471	Mercury	< 0.04	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS06-1-S	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.37	percent	
J17-SS06-1-S	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	2< X <10	mg/kg	
J17-SS07-1-S	0.25-0.5	7/13/94	6010	Arsenic	< 4	mg/kg	
J17-SS07-1-S	0.25-0.5	7/13/94	6010	Barium	57	mg/kg	
J17-SS07-1-S	0.25-0.5	7/13/94	6010	Cadmium	< 0.2	mg/kg	
J17-SS07-1-S	0.25-0.5	7/13/94	6010	Chromium	1.3	mg/kg	J
J17-SS07-1-S	0.25-0.5	7/13/94	6010	Lead	5.3	mg/kg	J
J17-SS07-1-S	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS07-1-S	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS07-1-S	0.25-0.5	7/13/94	7471	Mercury	< 0.04	mg/kg	
J17-SS07-1-S	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS07-1-S	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.2	percent	
J17-SS07-1-S	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	2< X <10	mg/kg	

FINAL

Summary Table of Analytical Data

SWMU J17 - Thorne Drums Area

Hawthorne Army Depot

Hawthorne, Nevada

January 1996

FINAL

Sample ID	Sample Depth (ft)	Sample Date	Method	Analyte	Value	Units	Flag
J17-SS08-1-S	0.25-0.5	7/13/94	6010	Arsenic	< 4	mg/kg	
J17-SS08-1-S	0.25-0.5	7/13/94	6010	Barium	62	mg/kg	
J17-SS08-1-S	0.25-0.5	7/13/94	6010	Cadmium	0.21	mg/kg	U
J17-SS08-1-S	0.25-0.5	7/13/94	6010	Chromium	1.8	mg/kg	J
J17-SS08-1-S	0.25-0.5	7/13/94	6010	Lead	< 5	mg/kg	
J17-SS08-1-S	0.25-0.5	7/13/94	6010	Selenium	< 5	mg/kg	
J17-SS08-1-S	0.25-0.5	7/13/94	6010	Silver	< 0.9	mg/kg	
J17-SS08-1-S	0.25-0.5	7/13/94	7471	Mercury	0.2	mg/kg	
J17-SS08-1-S	0.25-0.5	7/13/94	8015M	TPH (as diesel)	< 1	mg/kg	
J17-SS08-1-S	0.25-0.5	7/13/94	D2216	Moisture/TNFR	0.58	percent	
J17-SS08-1-S	0.25-0.5	7/13/94	D4031	Immunoassay BTEX	<2	mg/kg	

NEL LABORATORIES

CLIENT: Day & Zimmerman Hawthorne Corporation
PROJECT ID: NFA sites
PROJECT #: NA

CLIENT ID: **1-Thorne**
DATE SAMPLED: 6/4/98
NEL SAMPLE ID: R9806032-63

TEST: **TCLP-8 Metals**
MATRIX: Solid

PARAMETER	RESULT mg/L	REPORTING LIMIT	D. F.	METHOD	TCLP/STLC EXTRACTION DATE	DIGESTED	ANALYZED
Arsenic	ND	0.1 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Barium	ND	1. mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Cadmium	ND	0.01 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Chromium	ND	0.01 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Lead	ND	0.05 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Mercury	0.012	0.002 mg/L	10	EPA 7470A	6/9/98	6/16/98	6/16/98
Selenium	ND	0.1 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Silver	ND	0.02 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98

D.F. - Dilution Factor

ND - Not Detected

NEL LABORATORIES

CLIENT: Day & Zimmerman Hawthorne Corporation
PROJECT ID: NFA sites
PROJECT #: NA

CLIENT ID: **2-Thorne**
DATE SAMPLED: 6/4/98
NEL SAMPLE ID: R9806032-64

TEST: **TCLP-8 Metals**
MATRIX: Solid

PARAMETER	RESULT mg/L	REPORTING LIMIT	D. F.	METHOD	TCLP/STLC EXTRACTION DATE	DIGESTED	ANALYZED
Arsenic	ND	0.1 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Barium	ND	1. mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Cadmium	ND	0.01 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Chromium	ND	0.01 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Lead	ND	0.05 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Mercury	0.012	0.002 mg/L	10	EPA 7470A	6/9/98	6/16/98	6/16/98
Selenium	ND	0.1 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98
Silver	ND	0.02 mg/L	1	EPA 6010A	6/9/98	6/15/98	6/15/98

D.F. - Dilution Factor

ND - Not Detected

Appendix C

Survey Data at SWMU J-17
Hawthorne Army Depot
Hawthorne, Nevada

Point Name	Northing	Easting
J17REF48	1413340.25	487405.77
SS-1	1413544.21	487147.86
SS-2	1413498.7	487151.54
SS-3	1413343.14	487275.43
SS-4	1413453.84	487248.07
SS-5	1413328.93	487441.28
SS-6	1413491.81	487087.84
SS-7	1413489.25	487115.82
SS-8	1413367.94	487180.9

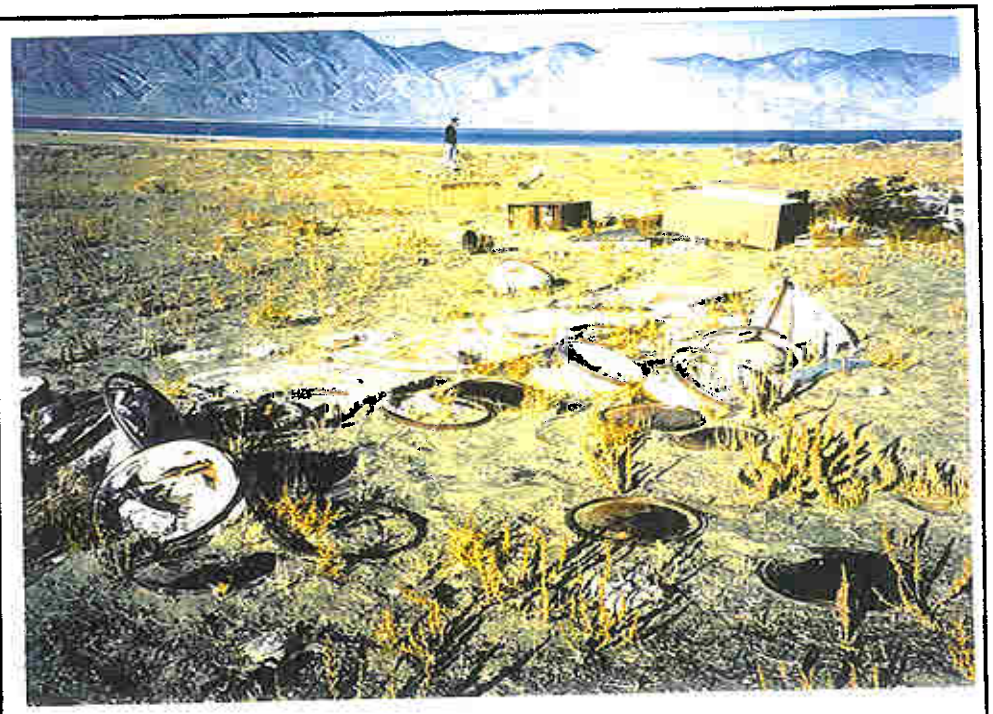
Footnote: Survey data in Nevada State Plane West, 1927 coordinates.

Appendix D

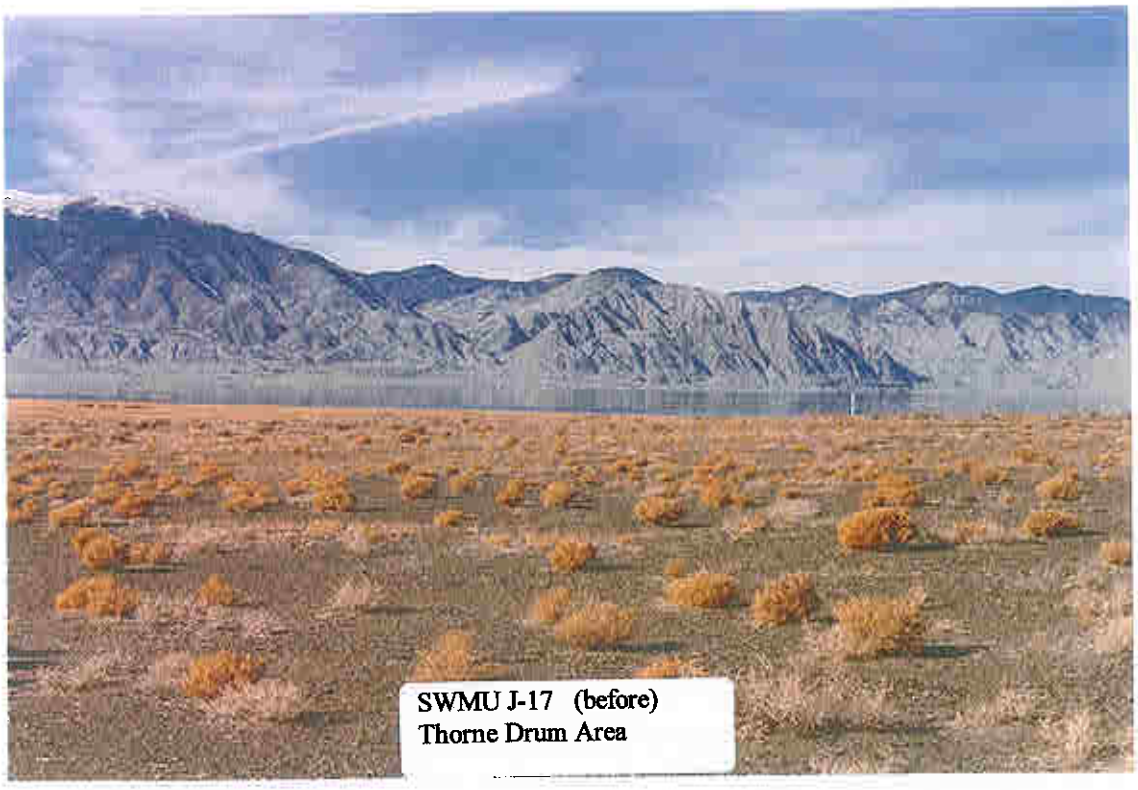
BEFORE

J-17, View to west from east edge of habitation site, showing tires and other debris on ground surface. #R4-P3, 11/4/93

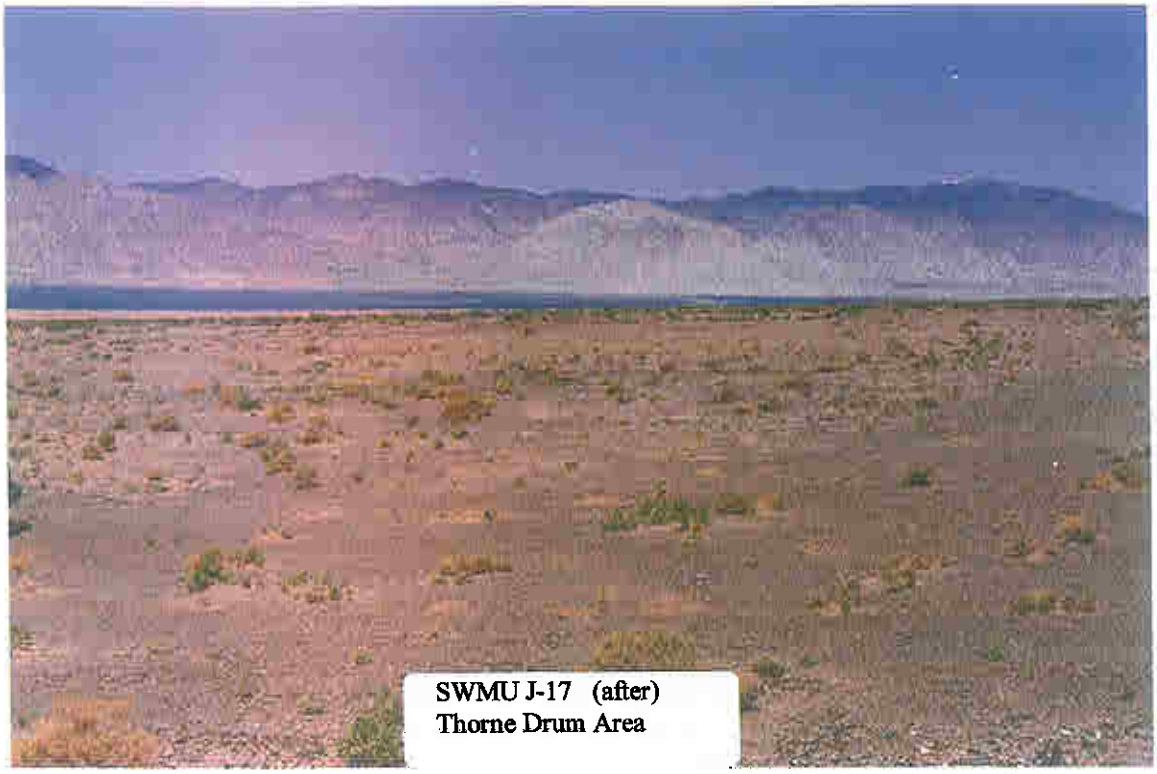
BEFORE



J-17. View to west from east edge of drum storage site. showing deteriorated fiber drums, metal drum tops; septic waste pit and former trailer site in center background. #R4-P4, 11/4/93



SWMU J-17 (before)
Thorne Drum Area



SWMU J-17 (after)
Thorne Drum Area